IMPLAN©

Introduction to the IMPLAN© V2.0 Modeling System

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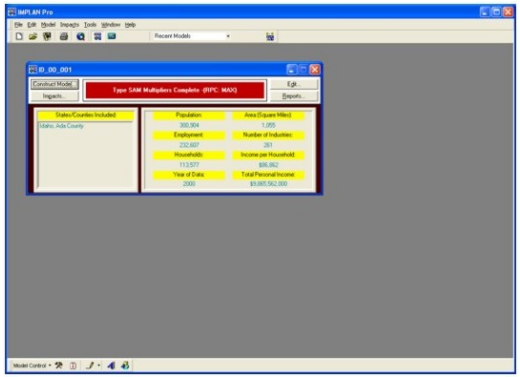
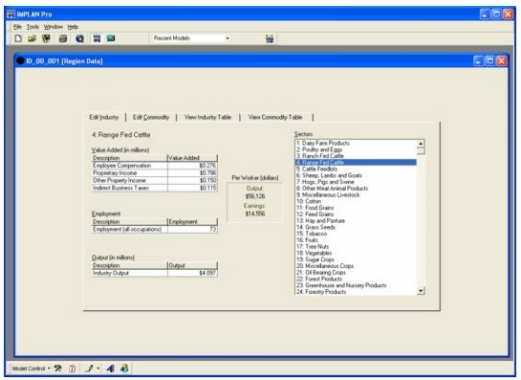
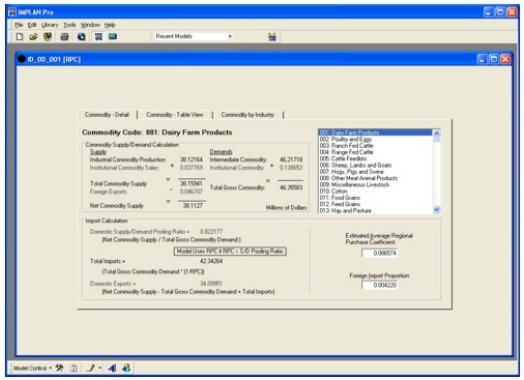
IMPLAN© is …Software & Data Packages





- Software to…
  - *Make Regional Accounts*
  - *Construct Impact Models*
  - *Tools to Frame Problems*
  - *Evaluate Economic Impacts*
  - *Training data set*
- Data can be purchased for…
  - *Places like States, Counties, ZIP codes*
  - *Accounting periods 1990 thru 2004*

IMPLAN© is used for …Creating Regional SAMs

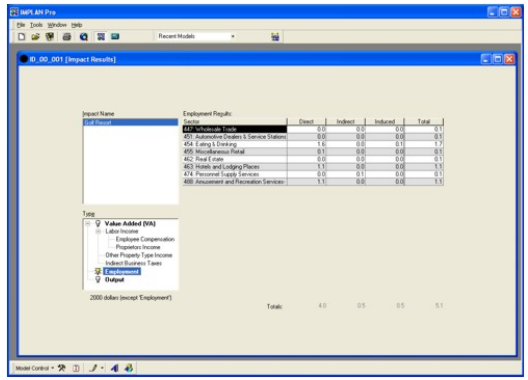


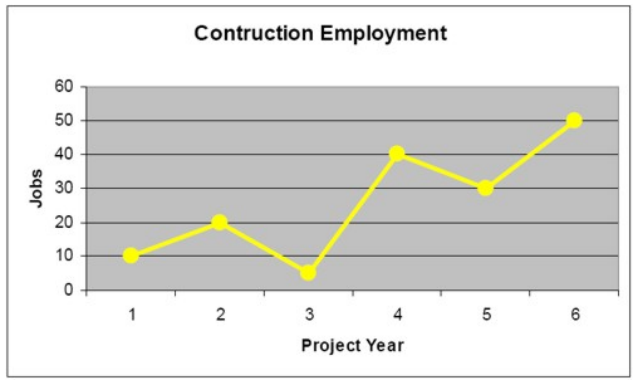
	Industries	Commodities	Factors	Institutions	Capital	Trade	Total
Industries		Make of Commodities (Byproducts and Market Shares tables in coefficient form				• Domestic Exports • Foreign Exports	Total Industry Output
Commodities	Use of Commodities (Absorption table in coefficient form)			• Households • Federal Government • State and Local Government	• Inventory Purchases • Investment	•	Total Commodity Output
Factors	• Employee Compensation • Proprietors Income • Indirect Business Taxes • Other Property Income						Total Factor Receipts
Institutions		• Household Sales • SL Sales • Federal Sales • Inventory Sales	Factor Payments to Institutions	Payments of Taxes Transfers between Institutions	Capital Payments to Institutions (Borrowing)	Institution Exports	Total Institution Receipts
Capital				Payments to Capital (Savings)		Net Foreign/Domestic Investment	Total Capital Receipts
Trade	Domestic Imports Foreign Imports		Factor Payments to Trade	Domestic Imports Foreign Imports		Trans-shipments	Total Trade Receipts
Total	Total Industry Outlay	Total Commodity Payments	Total Factor Payments	Total Institution Payments	Total Capital Payments	Total Trade Payments	

- For a given place and accounting period…
  - Double-entry Social Accounting Matrices (SAMs) of all transactions in an economy, both *market* and *non-market*
  - Shows the major functional components of an economy: *production*, *consumption*, *accumulation*, and *trade*

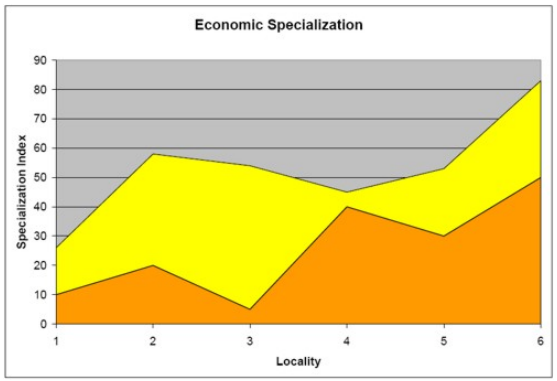
IMPLAN© is used for …Evaluating Economic Impacts

- Frame the issue
- Use IMPLAN© to estimate the distribution of economic impacts
- Evaluate the consequences of the issue





IMPLAN© is used for …Understanding Economies

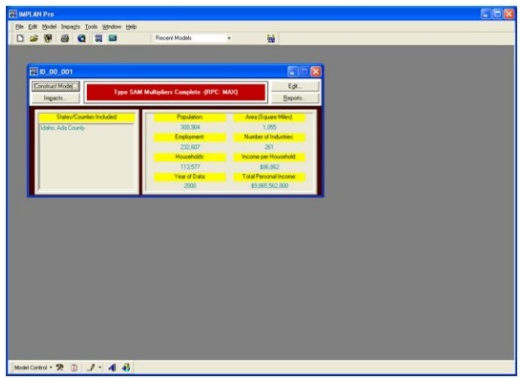


- Investigate…
  - Economic Specialization, Diversity, Income Distributions
  - Backward and Forward Linkages
  - Keystone Sectors, Industrial Clusters
  - Trade Flows, Commuting Patterns, Balance of Payments

Impact Analysis Results are Changes in each Industry's…

- **Total Industry Output** – total sales
- **Employment** – number of full- and part-time jobs
- **Total Value Added** – total payments to factors of production; Gross Regional Product
  - **Employee Compensation** – "payrolls"; wages & salaries, other labor income, employer & employee contributions to social security; gross payments to labor; place-of-work income
  - **Proprietor's Income** – income of sole proprietors & self-employed
    - **Labor Income** – Employee Compensation plus Proprietor's Income
  - **Other Property-Type Income** – rent, dividends, interest, profits
  - **Indirect Business Taxes** – taxes collected by businesses on behalf of government

Let's see IMPLAN© in action…



- DEMO – Create an IMPLAN SAM and Model

How Others Use IMPLAN©

- Industrial Targeting with IMPLAN - *Tom Johnson*
- A State-Level CGE Model for Evaluating Economic Development Policy - *David Kraybill and Dee-Yu Pai*
- Comparing County Level Travel and Tourism Impacts - *Bruce Lord and Charles Strauss*
- Economic Effects for Power Marketing Options in California's Central Valley - *David Anderson*
- Economic Impacts of Municipal Recycling - *Jared Creason and Michael Podolsky*
- The Role of Hydropower in the National and Regional Economies - *Alan Fox*
- The Economic Impacts of the Saltwater Fishing Tournaments in South Carolina - *Raymond Rhodes*
- The Economic Significance of the Aviation Industry to the Overall Wisconsin Economy - *Bob Russell*
- Evaluating the Socio-Economic Impacts of the Erie Canal Corridor Project - *Rainer vom Hofe and Sidney Saltzman*

IMPLAN Social Accounts

	Industries	Commodities	Factors	Institutions	Capital	Trade	Total
Industries		Make of Commodities (Byproducts and Market Shares tables in coefficient form				• Domestic Exports • Foreign Exports	Total Industry Output
Commodities	Use of Commodities (Absorption table in coefficient form)			• Households • Federal Government • State and Local Government	• Inventory Purchases • Investment	•	Total Commodity Output
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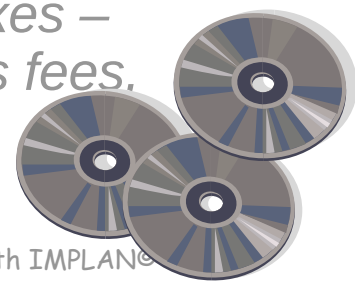
Total	Total Industry Output	Total Commodity Payments	Total Factor Payments	Total Institution Payments	Total Capital Payments	Total Trade Payments	
	Employment						

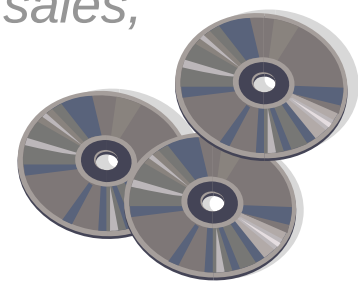
IMPLAN© Data Files, *"What's in the Box?"*

- Industry Data:
  - Output *(Value of production, similar to sales)*
  - Employment *(Part-time/full-time annual average including proprietors and wage and salary)*
  - Employee compensation *(ALL payroll costs)*
  - Proprietor Income *(Income of self-employed)*
  - Other Property Income *(Corporate profits, interest, rent and capital consumption allowance)*
  - Indirect Business Taxes *(All payments to government by industry except for payroll taxes and end of year taxes – includes sales, excise and property taxes as well as fees, fines and licenses)*



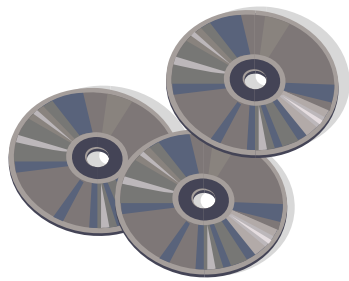
IMPLAN© Data Files, *"What's in the Box?"*

- For Institutions:
  - Household Consumption *(PCE for 509 commodities)*
  - Government Consumption *(Federal Military & Non-Military, State & Local Government, Education & Non-Education for 509 commodities)*
  - Capital Investment & Inventory Additions *(for 509 commodities)*
  - Institutional Sales *(HH used goods, Government sales, sales of inventory)*



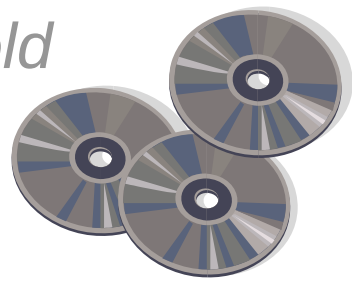
IMPLAN© Data Files, *"What's in the Box?"*

- For Trade:
  - Foreign Imports & Exports *(for 509 commodities)*
  - Domestic Imports & Exports *(gross trade flows county-to-county for 509 commodities)*
  - Regional Purchase Coefficients *(rate of local purchase of 509 commodities)*



IMPLAN© Data Files, *"What's in the Box?"*

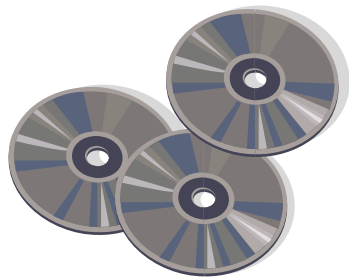
- Transfers *(payments by institutions to institutions)*
  - Household payments to government *(eg, income tax)*
  - Government payments to households *(eg, social insurance benefits and welfare payments)*
  - Capital Investment payments to government *(borrowing by government*
  - Household payments to captial *(household savings)*



IMPLAN© Data and Coverage

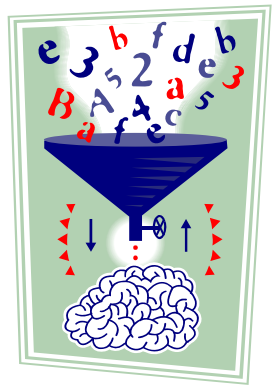
- Geographic & administrative coverage to construct complete Input-Output and Social Accounts for:
  - *US*
  - *States*
  - *Counties*
  - *Custom ZIP Code areas*
- Annual data series since 1990

- Data elements can be edited by the user:
  - *All data elements accessible*
  - *Care needs to be taken in editing transfers*

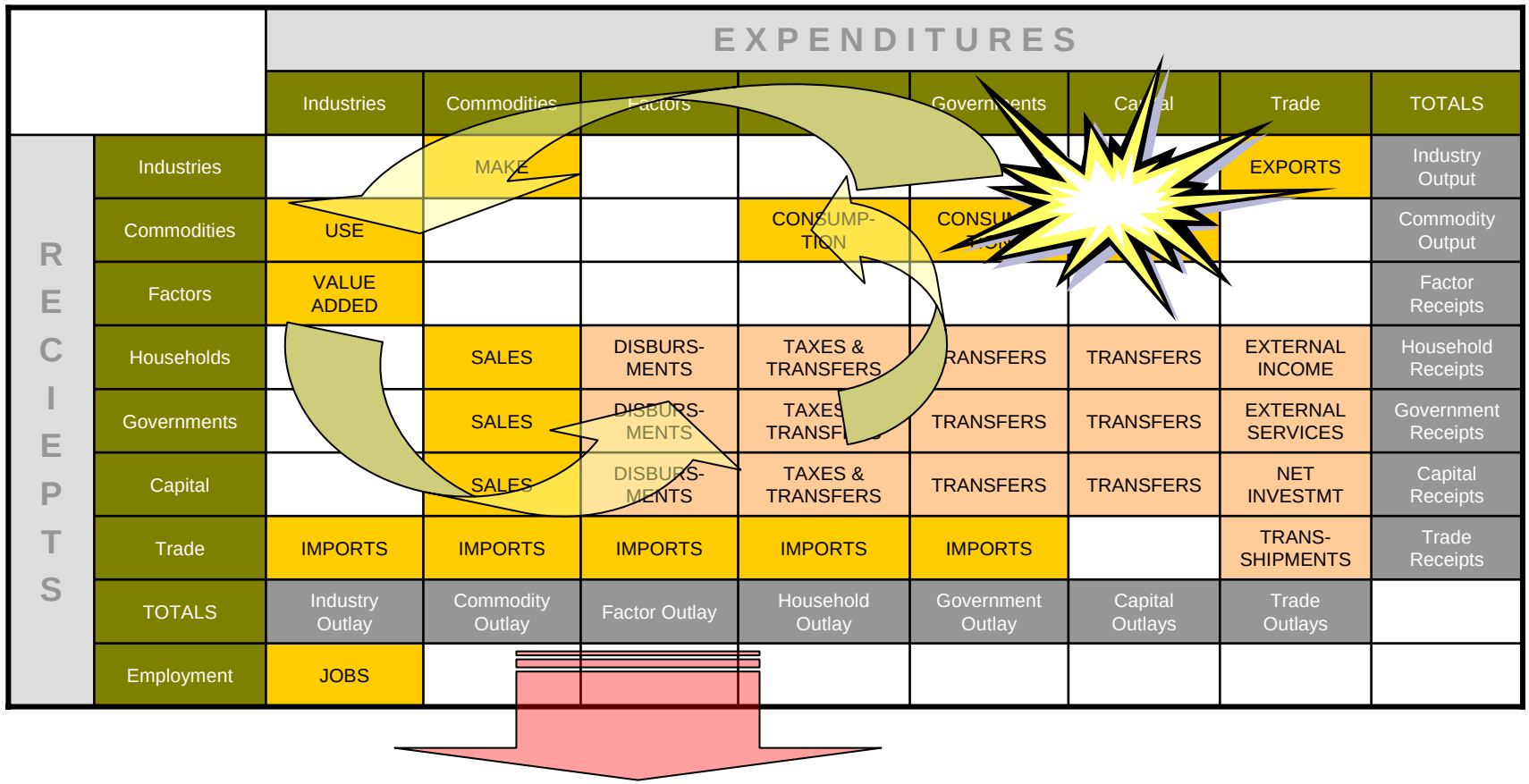


IMPLAN© Local Area Data Sources

- Many sources; here's some important ones:
  - *BLS Covered Employment and Wages (CEW)*
  - *BEA REIS Data*
  - *BEA Output Data*
  - *National Income & Product Accounts*
  - *BEA Current Benchmark I-O Study*
  - *Consumer Expenditure Survey*
  - *Economic Census – annual and 5 year*
  - *NASS agricultural statistics*
  - *County Business Patterns*

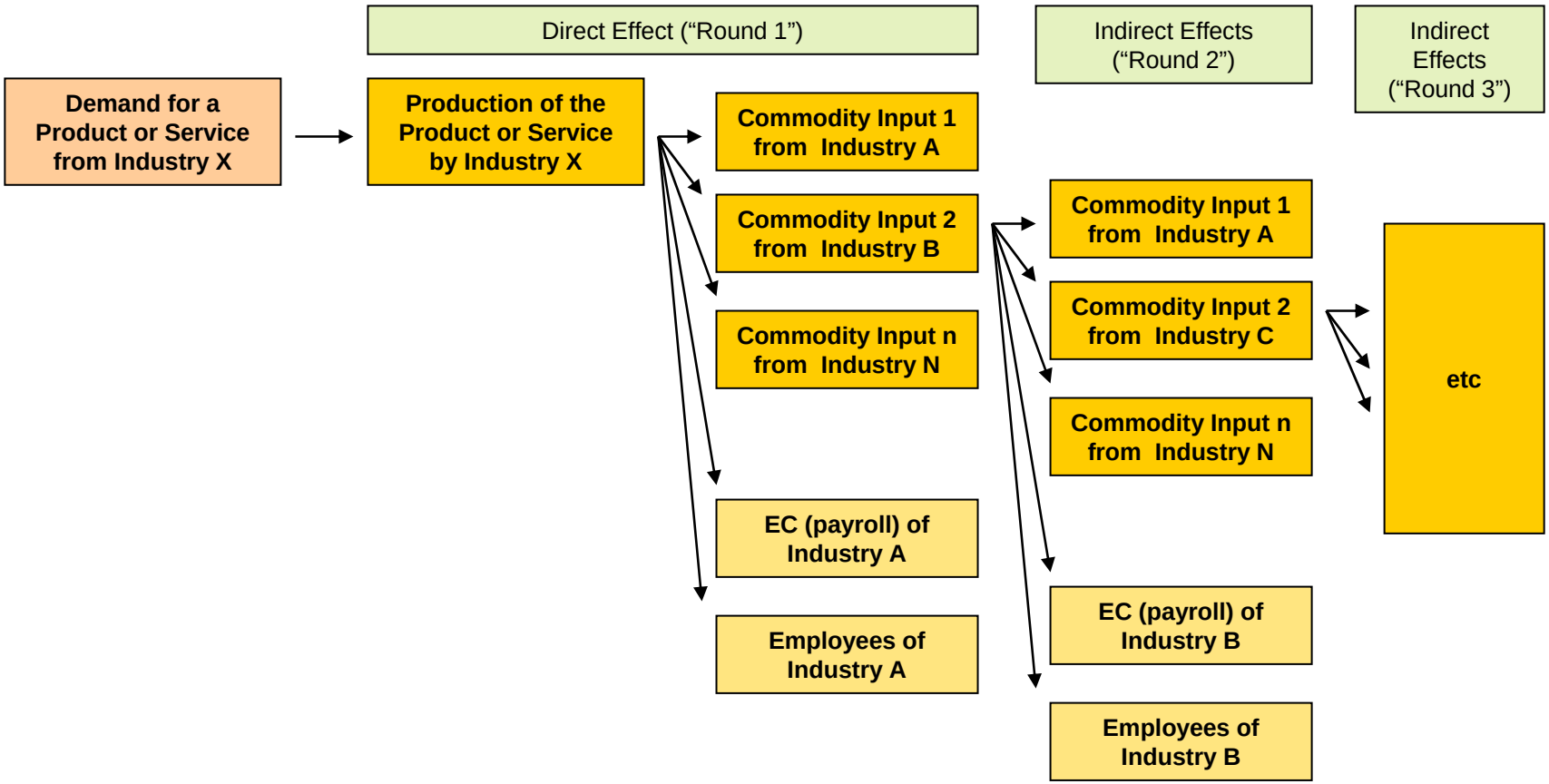


Income Cycle



RECEIPTS	EXPENDITURES: Industries	Commodities	Factors	Households	Governments	Capital	Trade	TOTALS
Industries		MAKE					EXPORTS	Industry Output
Commodities	USE			CONSUMP-TION	CONSUMP-TION			Commodity Output
Factors	VALUE ADDED							Factor Receipts
Households		SALES	DISBURS-MENTS	TAXES & TRANSFERS	TRANSFERS	TRANSFERS	EXTERNAL INCOME	Household Receipts
Governments		SALES	DISBURS-MENTS	TAXES & TRANSFERS	TRANSFERS	TRANSFERS	EXTERNAL SERVICES	Government Receipts
Capital		SALES	DISBURS-MENTS	TAXES & TRANSFERS	TRANSFERS	TRANSFERS	NET INVESTMT	Capital Receipts
Trade	IMPORTS	IMPORTS	IMPORTS	IMPORTS	IMPORTS		TRANS-SHIPMENTS	Trade Receipts
TOTALS	Industry Outlay	Commodity Outlay	Factor Outlay	Household Outlay	Government Outlay	Capital Outlays	Trade Outlays	
Employment	JOBS							

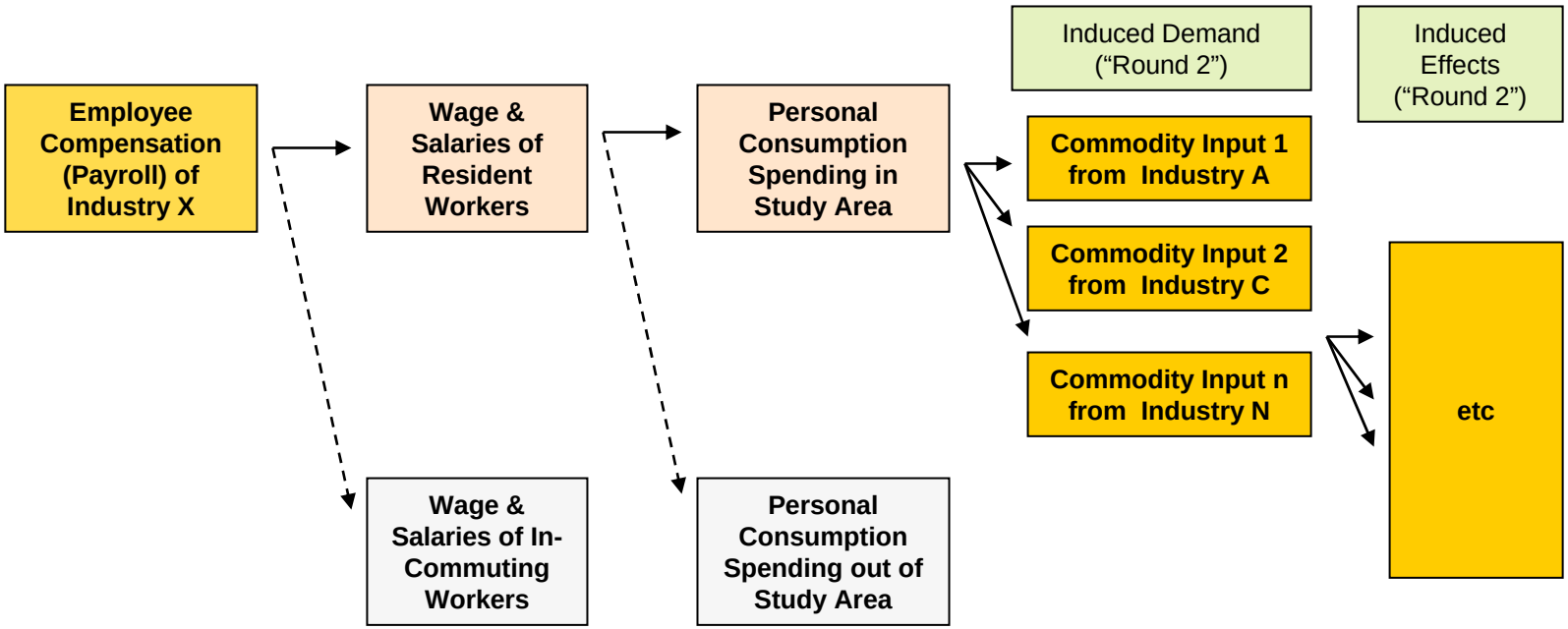
Backward Linkages, Part 1



Input-Output Analysis

- Power Series:
$$(1 + A + A^2 + A^3 + ...) = (1 - A)^{-1}$$
  - Rounds of local purchases
  - Based on the picture of the local economy
  - Limit of power series is Leontief inverse (multipliers)
  - The more leakages the smaller the result

Backward Linkages, Part 2



Impact – Industry Example

Industry Impact					FD Change		TIO Change
	Industries						
Industries	Ag	Manuf	Services				
Agriculture	1.099	0.100	0.063		5		5.493
Manufacturing	0.299	1.388	0.190	*	0	=	1.497
Services	0.647	0.612	1.777		0		3.236
Total Change							***10.226***

Use IMPLAN© for Questions like…

- Magnitude
  - "How many jobs are affected by X?"
- Distribution
  - "Which businesses are affected by X?"
- Spatial Location
  - "Where are effects of X located?"
- Contribution
  - "How much does X contribute to the economy?"
- Structure
  - "How is one part of the economy functionally related to another part of the economy?"

Don’t Use IMPLAN© for Questions like…

- Qualitative Valuation
  - “How much is a spotted owl worth?”
  - “What are the benefits and costs?”
- Efficiency
  - “Is business X more profitable than business Y?”
- Forecasting
  - “What will unemployment be in 2010?”
- Choosing
  - “Should I close this business?”
- Location
  - “Should we locate business X here?”
- Transportation
  - “What businesses will relocate to use the new highway?”

Flow of Funds >>

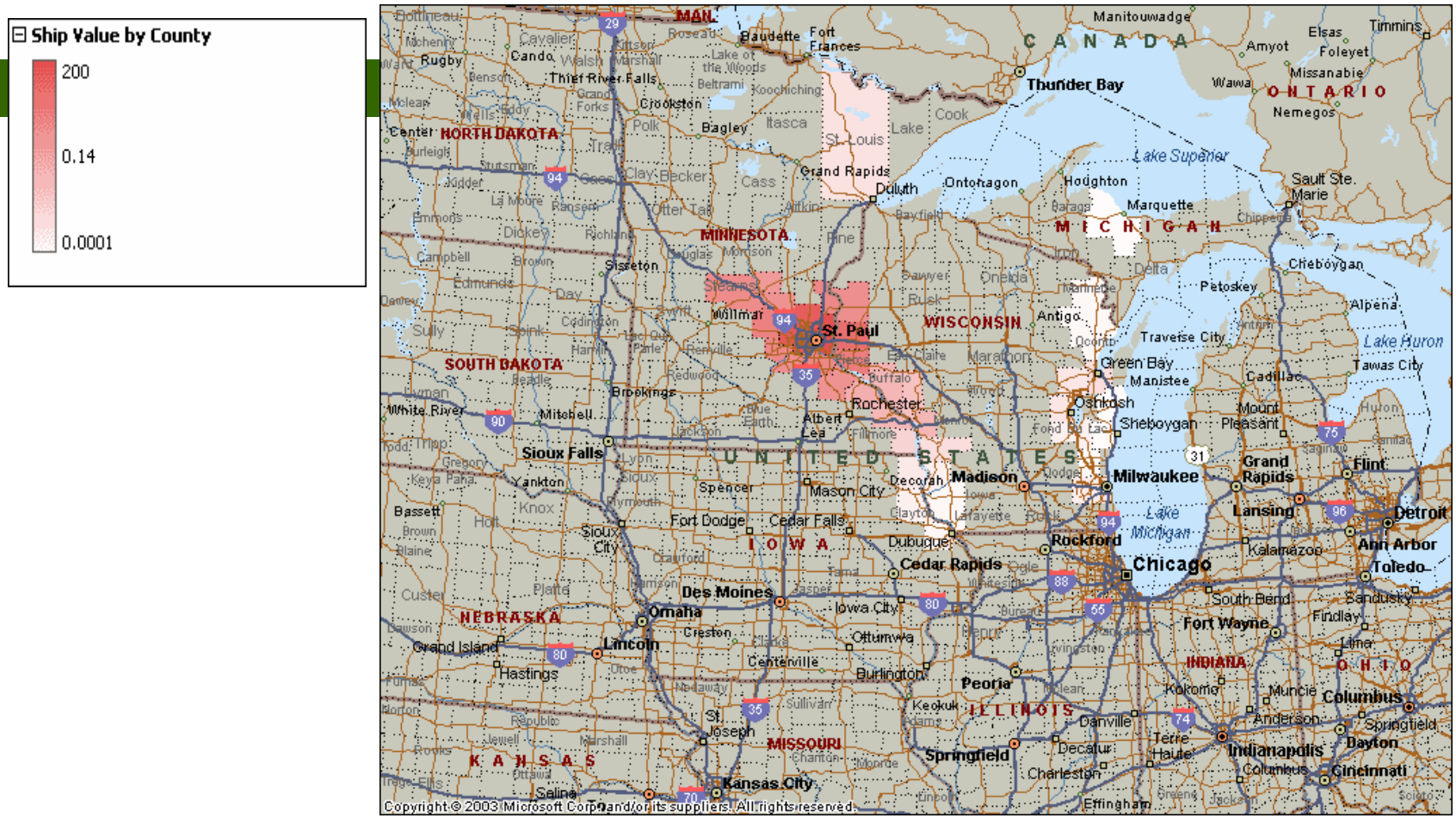
IMPLAN© Technical Support

- MIG, Inc. web site
  - WWW.IMPLAN.COM
  - Demo available
- Support@implan.com
- Soon! (www.implansupport.com)
  - User forums
  - Knowledge base, case studies, tutorials
  - Literature base
  - FAQs

IMPLAN 3.0

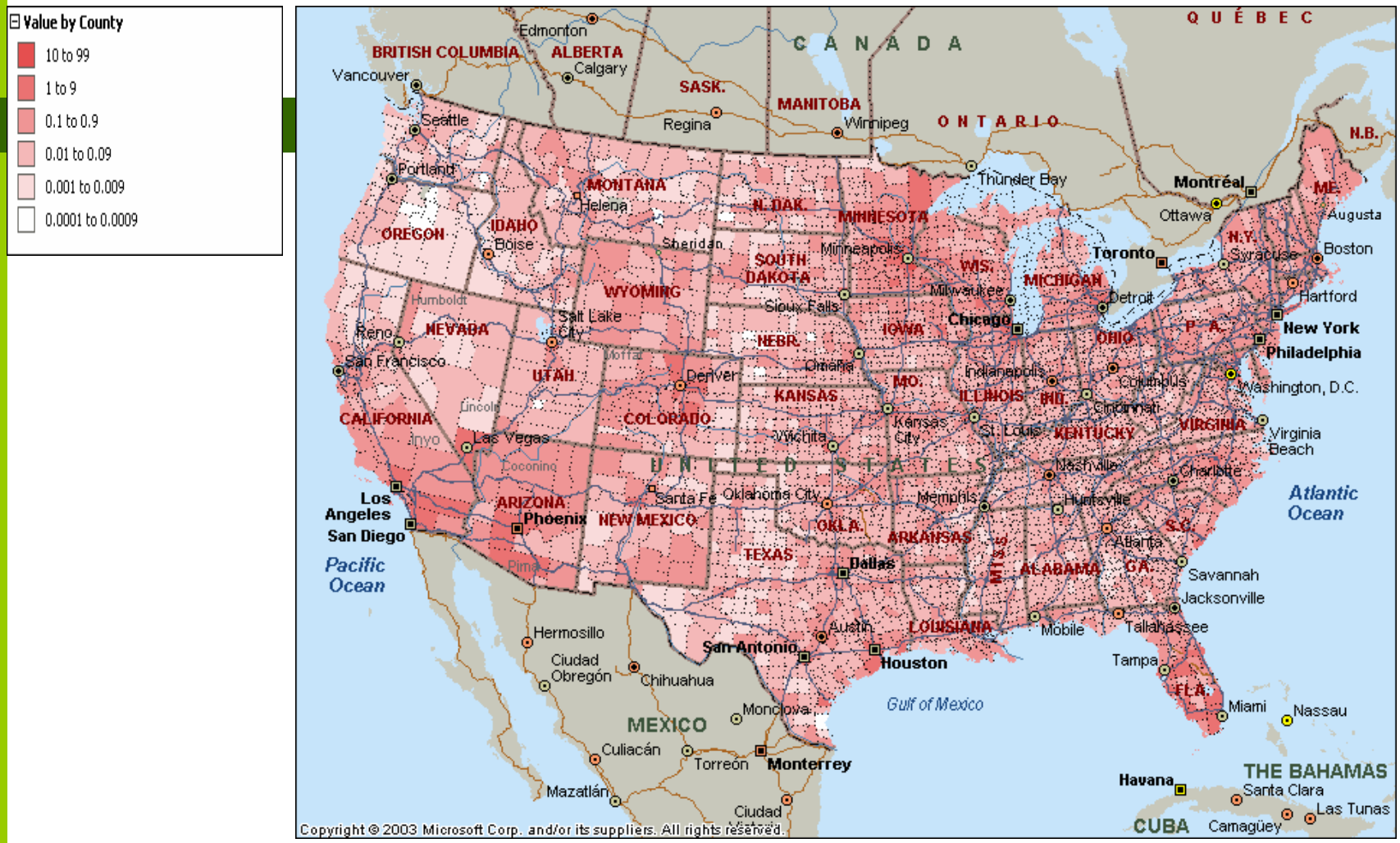
- New Interface
- Introducing specific firm data simplified
- Context help
- MRIO Modeling
  - Trade flows estimated by doubly constrained gravity model
  - Impacts on adjacent regions can be estimated

Refined Petro Shipments from Washington Co. MN

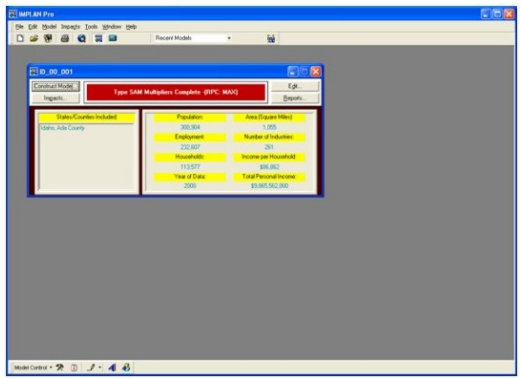


Fluid Milk Shipments from Washington Co. MN

Millwork Shipments from Washington Co. MN



Let's see IMPLAN© 3 in action…



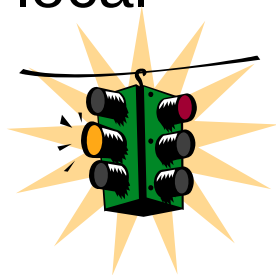
- DEMO

QUESTIONS?

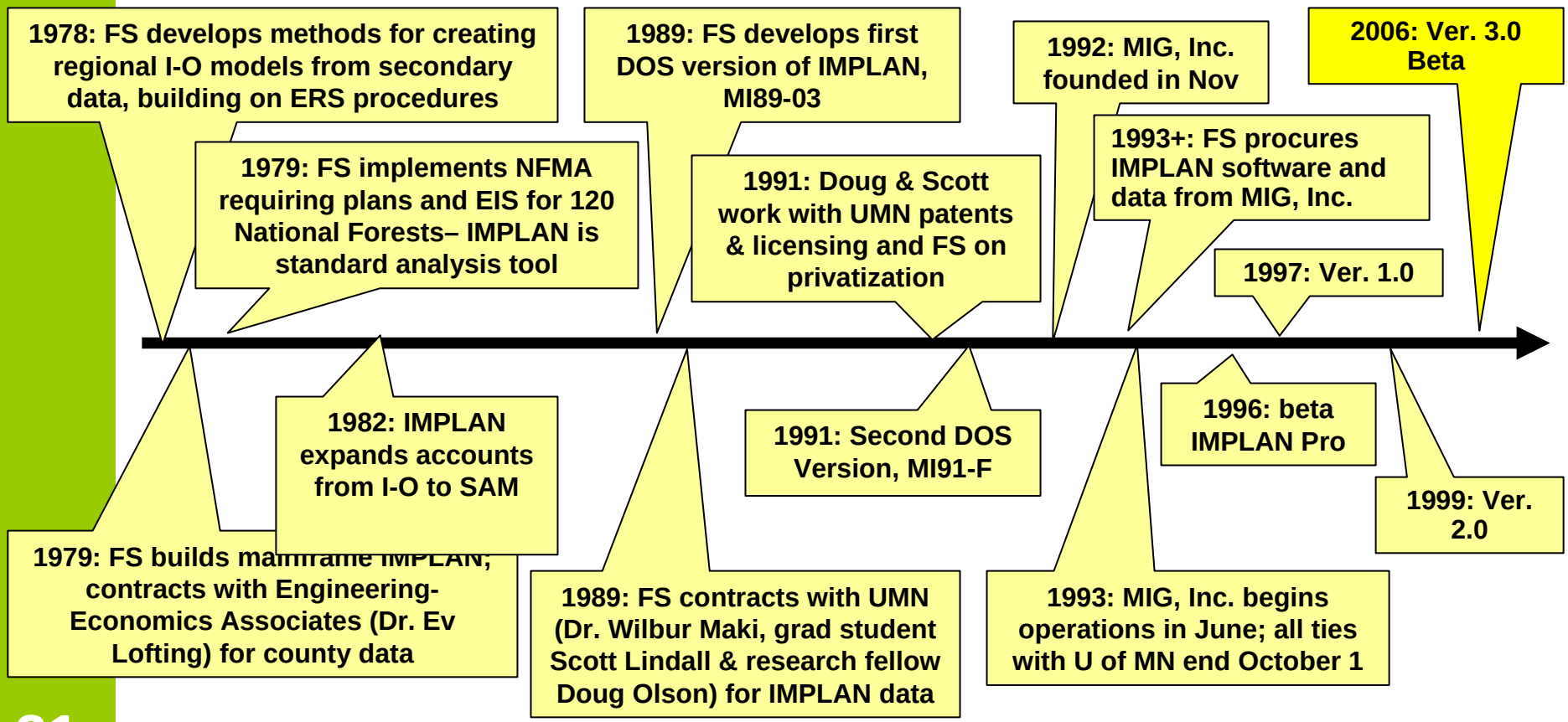
- When will version 3 be ready?
- When will 2005 IMPLAN data be ready?
- Can we introduce our fully disclosed CEW data?

Cautions about Multipliers

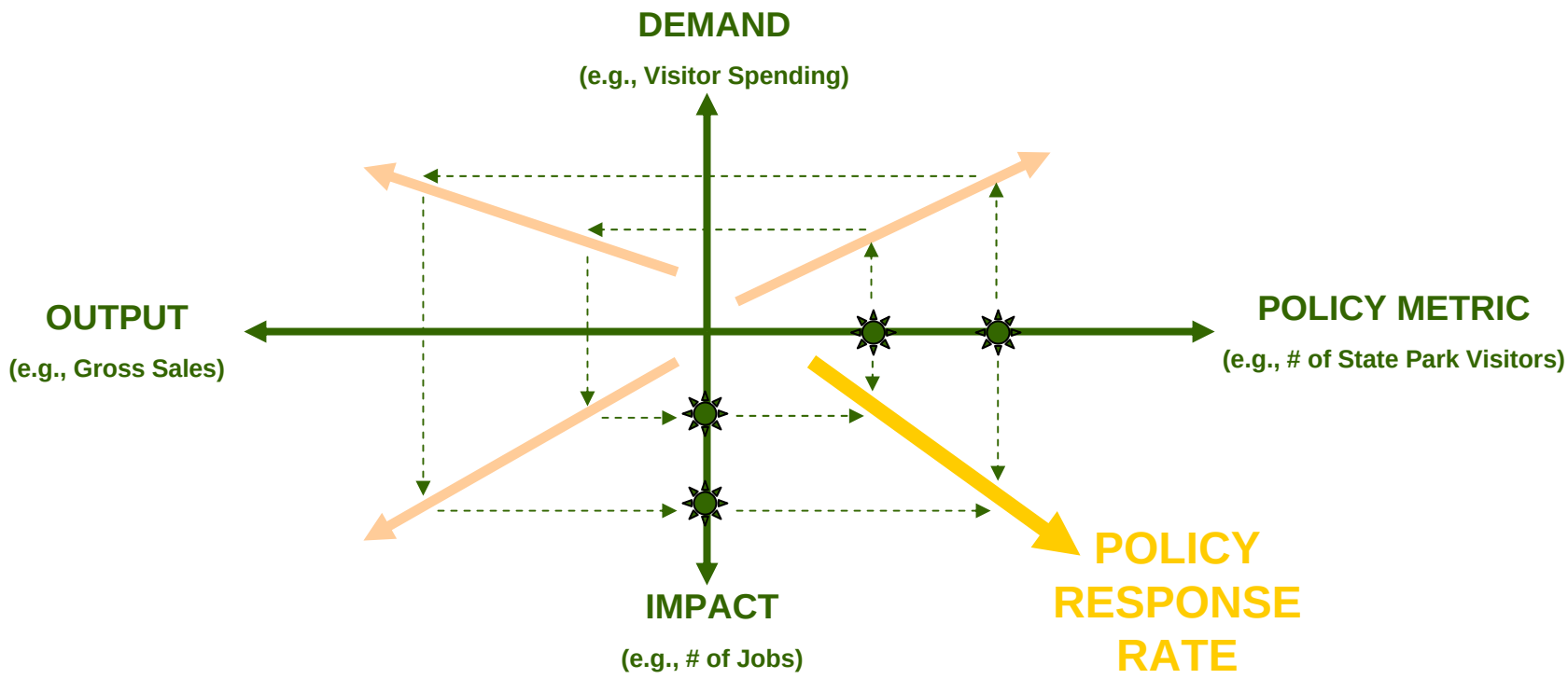
- Linear production technology
  - *If you need to produce more output, you need more inputs*
- No supply constraints
  - *If you need it, you can get it*
- No labor constraints
  - *Get all the labor you need*
- Production functions are averages adjusted for local value added-to-output relationships



History of IMPLAN© and MIG, Inc.



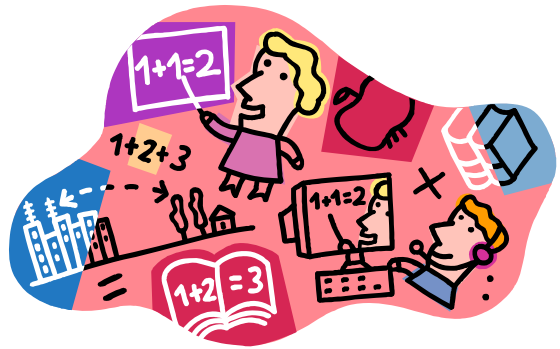
It’s a little more complicated…



Standard I-O Multiplier Model

- *Remember* **Y=C+I+G+(E-M)** ?

➢ $x = X + y$	• *Accounting Identity*
➢ $x = Ax + y$	• *Fixed Proportions*
➢ $y = x - Ax$	• *Rearrangement*
➢ $y = (I - A)x$	• *Factoring*
➢ $x = (I - A)^{-1}y$	• *Multiplier Model*



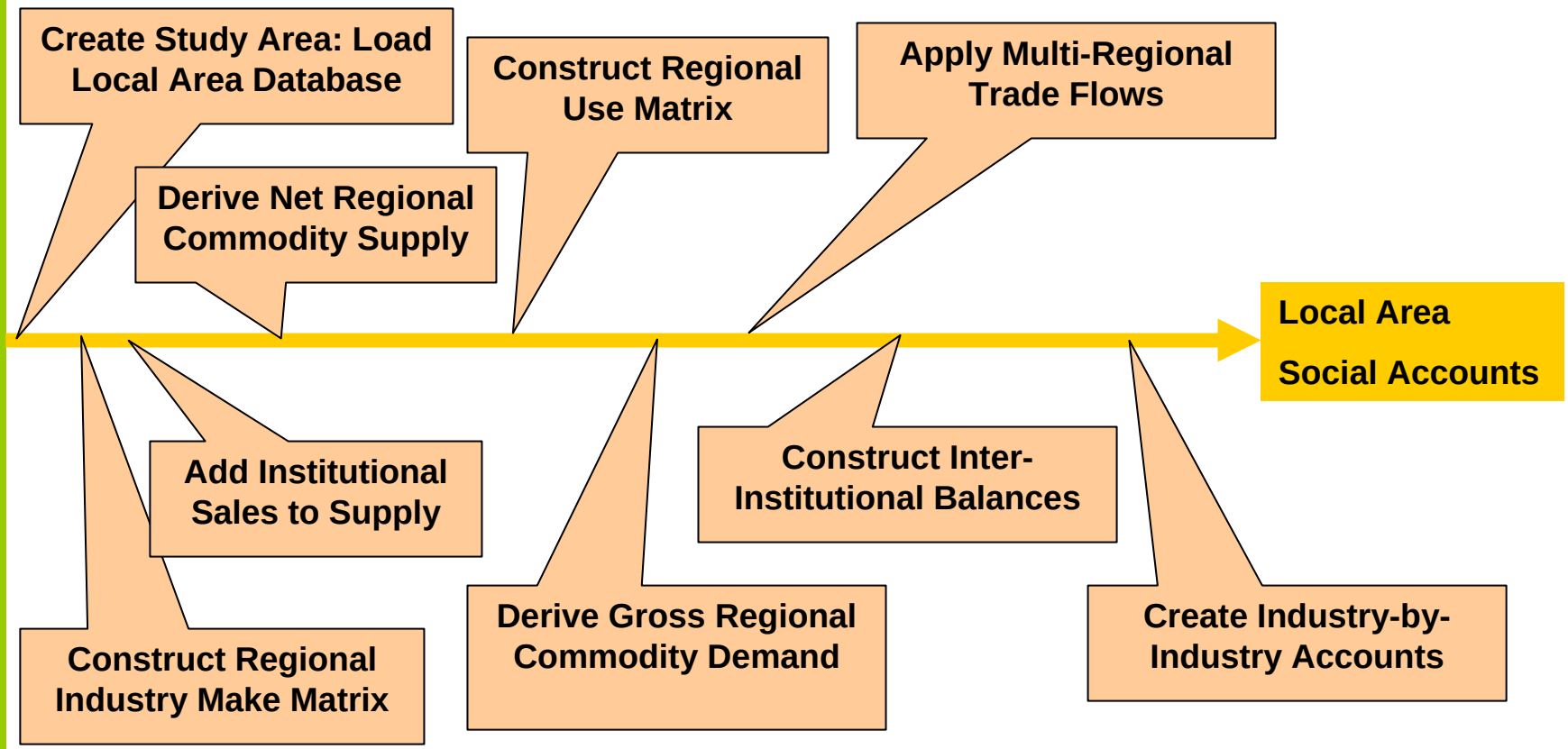
Multipliers – Numerical Example

Industry by Industry Transactions Table							
	Industries			***Institutions***			**Total**
Industries	Ag	Manuf	Services	HHs	Other Inst	Exports	Output
Agriculture	66	173	128	25	445	322	1,158
Manufacturing	151	661	177	496	880	808	3,173
Services	150	388	1,053	2,326	761	398	5,077
Labor Income	397	837	2,141				
Other VA	249	585	1,183				
Households	2	4	12	26	9		
Other Institutions	9	24	48	101	47		
Trade	135	500	334	703	1,238		
Total Outlay	1,158	3,173	5,077	3,677	3,381	1,529	

Multipliers example continued…

Type I Multipliers					
Direct Coefficients Table					
	Industries			***Institutions***	
Industries	Ag	Manuf	Services	HHs	Other Inst
Agriculture	0.057	0.054	0.025	0.007	0.132
Manufacturing	0.130	0.208	0.035	0.135	0.260
Services	0.129	0.122	0.207	0.633	0.225
Labor Income	0.343	0.264	0.422	0.000	0.000
Other VA	0.215	0.184	0.233	0.000	0.000
Households	0.001	0.001	0.002	0.007	0.003
Other Institutions	0.008	0.008	0.009	0.027	0.014
Trade	0.117	0.158	0.066	0.191	0.366
Total Outlay	1.000	1.000	1.000	1.000	1.000

Constructing Social Accounts



IMPLAN V3.0 Multi-Regional Trade

- Gross commodity and factor flows are modeled as a multi-modal trade flow system
- Query:
  - *"Show all shipments of commodity X FROM all counties TO county Y."*
- Query:
  - *"Show all shipments of commodity X TO all counties FROM county Y."*

IMPLAN V3.0 Multi-Regional Models

- Single-region models can be linked together into multi-regional systems
- Theoretically, any number of models can be linked. Practically we expect most applications to link 2 – 5 models
- Query:
  - *"Something happens in counties A and B. What are the consequences for each individual county A, B, C, D, and E?"*